## **ABSTRACT**

Growth hormone (GH) release in vertebrates may be augmented by an oral dietary supplement composed of acetyl-l-carnitine and l-ornithine acting in synergy. Augmentation is most efficacious by ingestion at night sleep after a short fast, but may be used during the day. Human dosages in subgram levels allow precise and reliable control of the level of augmented GH release over greater than one order of magnitude range above normal levels. This method can: return aging declined GH release to young adult levels, cause rapid fat loss without protein loss or extreme hunger, enable prolonged wakeful alertness and strength during emergencies, promote anabolic function in catabolic disease or trauma, and rapidly mature domestic animals.

## **US PATENT DOCUMENTS**

			(optional)
US Patent No.	DATE	NAME	Class/SubCLASS
5855920	Jan. 1999	Chein	424/568
4411890	Oct.,1983	Momany	514/17
5576351	Nov., 1996	Yoshimura et al.	514/565
6166077	Dec., 2000	De Simone	514/556
5240961	Aug., 1993	Shug	514/556
5817329	Oct., 1998	Gardiner	424/439

## **Foreign Patent Documents**

WO9959543-A	1999.11.25	Ma
WO 97/06803	27.02.1997	Dodge
WO9640105-A	96.12.19	van Cauter
WO9744042-A	97.11.27	van Cauter
WO0021526-A	1998.10.09	Cavazza
WO0011968-A	1999.08.19	Cavazza
WO0028986-A	2000.05.25	Cavazza
WO9801128	1998.01.15	Mendes
WO 98/44793	15.10.1998	Grant
WO 00/64283	27.04.2000	White

## OTHER REFERENCES CITED

- 1. Kojima M., Hosoda H., Date Y., Makazato M., Matsuo H., Kangawa K. (1999) Ghrelin is a growth-hormone-releasing acylated peptide from the stomach. Nature 402:656-660
- 2. van Coevorden A., Mockel J., Laurent E., Kerkhofs M., L'Hermite-Baleriaux M.,
  Decoster C., Neve P., van Cauter E. (1991) Neuroendocrine rhythms and sleep in
  aging men. Am J Physiol 260:E651-E661
- 3. Mendelson W.B., Lantigua R.A., Wyatt R.J., Gillin C., Jacobs L.S. (1981) Piperidine Enhances Sleep-Related and Insulin-Induced Growth Hormone Secretion: Further Evidence of a Cholinergic Secretory Mechanism. J Clin Endocrinol Metab 52:409-415
- van Cauter E, FW Turek 1995 Endocrine and Other Biological Rhythms. In: DeGroot LJ (eds) Endocrinology 3 rd Ed. Vol 3. W. B. Saunders Co., Philadelphia, pp 2487-2548
- Muller EE 1995 Role of Neurotransmitters and Neuromodulators in the Control of Anterior Pituitary Hormone Secretion. In: DeGroot LJ (eds) Endocrinology, 3rd Edition, Vol.I. pp 178-191
- 6. Wass JA, M Besser 1995 Tests of Pituitary Function. In: DeGroot LJ (eds)

- Endocrinology 3rd Ed. Vol. 1. W.B. Saunders Co., Philadelphia, pp 487-496
- 7. Parker M.L., hammond J.M., Daughaday W.H. (1967) The Arginine Provocative Test:
  An Aid in the Diagnosis of Hyposomatotropism. J Clin Endocrinol Metab
  27:1129-1136
- 8. Corpas E., Blackman M.R., Robertson R., Scholfield D., Harman S.M. (1993) Oral Argenine-Lysine Does not Increase Growth Hormone or Insulin-like Growth Factor-I in Old Men. J Gerontol 48:M128-M133
- 9. Chin M.-Y., Kreutzer R.A. (1992) Acute Poisoning from g-Hydroxybytyrate in California. W J Med 156:380-384
- 10. Parr T. (1996) Insulin Exposure Controls the Rate of Mammalian Aging. Mech Ageing Dev 88:75-82
- 11. Parr T. (1997) Insulin Exposure and Aging Theory. Gerontology 43:182-200
- 12. Parr T. (1999) Insulin Exposure and Unifying Aging. Gerontology 45:121-135
- 13. Parr T.B. (2001) A New Technique to Elevate of Night Time Growth Hormone Release and a Potential Growth Hormone Feedback Control Loop. Med Hypotheses 56:610-613
- 14. Paradies G., Ruggiero F.M., Petrosillo G., Gadaleta M.N., Quagliariello E. (1994) The Effect of Aging and Acetyl-L-carnitine on the Function and on the Lipid Compostion of Rat Heart Mitochondria. Ann. N. Y. Acad. Sci. 717: 233-243
- 15. Buttgereit F., Brand M.D. (1995) A hierarchy of ATP-consuming processes in mammalian cells. Biochem J 312:163-167
- 16. Castorina M., Ferraris L. (1994) Acetyl-L-carnitine affects aged brain receptor system in rodents. Life Sci 54:1205-1214
- 17. Ranke MB 1995 Growth Hormone Insufficiency: Clinical Features, Diagnosis, and Therapy. In: DeGroot LJ (eds) Endocrinology 3 rd Ed., W. B. Saunders Co., Philadelphia, pp
- 18. Besset A., Bonardet A., Roundouin G., Descommps B., Passouant P. (1982) Increase in sleep related GH and Prl secretion after chronic agrinine aspartate administration in man. Acta Endocrinol 99:18-23
- Spagnoli A., Lucca U., Menasce G., Bandera L., Cizza G., Forloni G., Tettamanti M., Frattura L., Tiraboschi P., Comelli M., Senin U., Longo A., Petrini A., Brambilla G., Belloni A., Negri C., Cavazzuti F., Salsi A., Calogero P., Parma E., Stramba-Bidiale M., Vitali S., Andreoni G., Inzoli M.R., Santus G., Caregnato R., Peruzza M., Favaretto M., Bozeglav C., Alberoni M., Ed Leo D., Serraiotto L., Baiocchi A., Sciccia S., Culotta P., Ieracitano D. (1991) Long -term acetyl-L-carnitine treatment in Alzheimer's disease. Neurology 41:1726-1732
- 20. Bowman B.A. (1992) Acetyl-carnitine and Alzheimer's disease. Nutr Rev 50:142-
- 21. Pettegrew J.W., Klunk W.E., Panchalingam K., Kanfer J.N., McClure R.J. (1995)
  Clinical and neurochemical effects of acetyl-L-carnitine in Alzheimer's disease.
  Neurobiol Aging 16:1-4
- 22. Goa K.L., Brogden R.N. (1987) I-Carnitine A Preliminiary Review of its Pharmokinetics, and its Therapeutic use in Ischemic Cardiac Diseases and Primary and Secondary Carnitine Deficiencies in Relationship to its Role in Fatty Acid Metabolism. Drugs 34:1-24
- 23. Varanasi R.V., Saltzman J.R. (1995) Ornithine Oxoglutarate Therapy Improves Nutrition Status. Nutr Rev 53:96-97
- 24. Tabor H., Tabor C.W., Rosenthal S.M. (1961) The Biochemistry of the Polyamies:

Spermidine and Spermine. Annu Rev Biochem 30:579-605
25. Cynober L. (1994) Can arginine and ornithine support gut functions? Gut 35:S42-S45

Disclosure Document Reference (NOT APPLICABLE)